I CLAIM:

1. A device for providing angular displacement of an axis in a direction selected from the X or Y direction or rotational movement about the Z direction with respect to said axis, comprising:

a magnetic core element producing a magnetic field and defining a Z axis, said core element being capable of displacement in the X and Y directions respectively, and also rotational movement about the Z axis;

coil means proximate said core element for introducing a distortion force in said core element in at least one of said X and Y directions or about said Z axis as desired; and

mounting means for suspending said core element with respect to said coil means to permit relative movement therebetween in response to said distortion force.

2. The device of claim 1, wherein said mounting means comprises a spring mounting one end of said core element and one end of said coil means.

3. The device of claim 1, wherein said mounting means comprises a pair of springs each mounting one end of said core element and one end of said coil means.

4. The device claim 1, wherein said core element includes an axial mount aligned along said Z axis and positioned to move in response to movement of said core element.

5. The device of claim 4, wherein said axial mount includes a mirror mounted thereon for movement in response to said distortion force.

6. The device of claim 5, wherein said mirror is aligned in a plane generally perpendicular to said Z axis.

7. The device of claim 5, wherein said mirror is aligned in a plane generally parallel to said Z axis.

8. The device of claim 1, which further includes a ferromagnetic ring surrounding said core element and said coil means includes a coil wound around a portion of the periphery of said ring.

9. The device of claim 1, wherein said coil means includes an annular coil surrounding said Z axis and spaced from said core element.

10. The device of claim 1, which further includes a ferromagnetic ring surrounding said coil element and spaced from said core element to define an annular gap, and said coil means includes a first annular coil surrounding said Z axis and mounted in said annular gap.

11. The device of claim 10, which further includes a second coil around a portion of the periphery of said ring.

12. The device of claim 11, wherein said magnetic field substantially penetrates only one side of said second coil.

13. The device of claim 8, wherein said ferromagnetic ring has at least one bearing plate mounted on one end of said ring, said core including an axial mount aligned along said Z axis and positioned to moved in response to movement of said core, said mount being journaled in said bearing plate to restrict movement of said mount to rotational movement about said Z axis.

14. The device of claim 13, wherein said ferromagnetic ring includes a second bearing plate mounted on the opposite end of said ferromagnetic ring to said first bearing plate, said mount also being journaled in said second bearing plate to further restrict angular displacement of said axis to rotation in said Z axis.

15. The device of claim 8, wherein said mounting means comprises at least one pair of springs each mounted at opposite ends of said magnetic core.

16. The device of claim 11 wherein, said mounting means comprises at least one pair of springs each mounted at opposite ends of said magnetic core.

17. A device for providing angular displacement of an axis in a direction selected from the X or Y direction or rotational movement about the Z direction with respect to said axis, comprising:

a magnetic core element producing a magnetic field and defining a Z axis, said core element being capable of displacement in the X and Y directions respectively, and also rotational movement about the Z axis;

a ferromagnetic ring surrounding at least a portion of said core element to produce a distortion force in at least one of said X and Y directions or about Z axis as desired, said ring including a coil wound around a portion of the periphery thereof; and

mounting means for suspending said core element with respect to said coil means to permit relative movement therebetween in response to said distortion force.

18. The device of claim 17, wherein said ring comprises an annular ring centered on said axis.

19. The device of claim 17, wherein said ring comprises an annular ring centered on said axis and having a gap in its periphery at a location radially opposite said coil.

20. The device of claim 17, wherein said ring comprises an annular ring centered on said axis and having a gap in its periphery and said coil comprises two coils wound on the periphery of said coil and each spaced approximately 90° radially from said gap.

21. The device of claim 21, wherein said magnetic core element is sized to have a length facing said gap and the portion of the periphery 180° radially from said gap and a width shorter than said length to provide increased spacing between said element and said ring proximate said two coils.

22. The device of claim 17, wherein said ring includes a magnetic damper means for reducing the annular gap between said ring and said core element at a point about 180° radially from said coil.

23. The device of claim 22 wherein said magnetic damper means includes a radially inwardly facing screw threaded to adjustably vary the distance between said screw and said coil.

24. The device of claim 6, wherein a solenoid coil is attached at one end of said core element.

25. The device of claim 24, wherein said solenoid coil is wound on a ferromagnetic core.

26. The device of claim 2 which includes an aperture for light to enter one end of said device;

a first mirror mounted to the device and stationary with respect to said coil;

an aperture in said mounting means through which light may pass;

a second mirror mounted to move in response to movement of said core element; and

an exit aperture for a scanned beam of light to exit said device.

27. The device of claim 26, wherein said second mirror is mounted on a wedge shaped mount and generally parallel to said first fixed mirror permitting a beam which enters the device to be reflected from said second moveable mirror and exit the device as a scanned beam proceeding forward in the same general direction as the input beam.

28. The device of claim 27, wherein the device is configured to cause the input beam to first reflect form said moveable mirror then form said fixed mirror.